

SEQUENCE LISTING

SEQ ID 1: Sequence From plasmid pRR64, similar to that from the Ross River Virus
Genome Nucleotides 8380-11330 with the exceptions noted in Kuhn et al., (1991)
Virology 182:430-431 and in Example 2 herein

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atg tct gcc gcg ctg atg atg tgt atc ctt gcc aac acc tct ttc ccc tgc tca tca cct ccc tgc
met ser ala ala leu met met cys ile leu ala asn thr ser phe pro cys ser ser pro pro cys

tac ccc tgc tgc tac gaa aaa cag cca gaa cag aca ctg cgg atg ctg gaa gac
tyr pro cys cys tyr glu lys gln pro glu gln thr leu arg met leu glu asp

aat gtg aat aga cca ggg tac tat gag cta ctg gaa gcg tcc atg aca tgc aga aac aga tca cgc
asn val asn arg pro gly tyr tyr glu leu leu glu ala ser met thr cys arg asn arg ser arg

cac cgc cgt agt gta aca gag cac ttc aat gtg tat aag gct act aga ccg tac
his arg arg ser val thr glu his phe asn val tyr lys ala thr arg pro tyr

tta gcg tat tgc gct gac tgt ggg gac ggg tac ttc tgc tat agc cca gtt gct atc gag aag atc
leu ala tyr cys ala asp cys gly asp gly tyr phe cys tyr ser pro val ala ile glu lys ile

cga gat gag gcg tct gac ggc atg ctc aag atc caa gtc tcc gcc caa ata ggt
arg asp glu ala ser asp gly met leu lys ile gln val ser ala gln ile gly

ctg gac aag gca ggt acc cac gcc cac acg aag atc cga tat atg gct ggt cat gat gtt cag gaa
leu asp lys ala gly thr his ala his thr lys ile arg tyr met ala gly his asp val gln glu

tct aag aga gat tcc ttg agg gtg tac acg tcc gca gcg tgc tct ata cat ggg
ser lys arg asp ser leu arg val tyr thr ser ala ala cys ser ile his gly

acg atg gga cac ttc atc gtc gca cat tgt ccg cca ggc gac tac ctc aag gtt tgc ttc gag gac
thr met gly his phe ile val ala his cys pro pro gly asp tyr leu lys val ser phe glu asp

gca gat tca cac gtg aag gca tgt aag gtc caa tac aag cac gac cca ttg ccg
ala asp ser his val lys ala cys lys val gln tyr lys his asp pro leu pro

gtg ggt aga gag aag ttc gtg gtt aga ccc cac ttt ggc gta gag ctg cca tgc acc tca tac cag
val gly arg glu lys phe val val arg pro his phe gly val glu leu pro cys thr ser tyr gln

ctg aca aca gct ccc acc gac gag gag atc gac atg cac aca ccg cca gat ata
leu thr thr ala pro thr asp glu glu ile asp met his thr pro pro asp ile

ccg gat cgc acc ctg cta tca cag acg gcg ggc aac gtc aaa ata aca gca ggc ggc agg act atc
pro asp arg thr leu leu ser gln thr ala gly asn val lys ile thr ala gly gly arg thr ile

agg tac aat tgt acc tgt ggc cgt gac aac gta ggc act acc agt act gac aag
arg tyr asn cys thr cys gly arg asp asn val gly thr thr ser thr asp lys

acc atc aac aca tgc aag att gac caa tgc cat gct gcc gtt acc agc cat gac aaa tgg caa ttt
thr ile asn thr cys lys ile asp gln cys his ala ala val thr ser his asp lys trp gln phe

acc tct cca ttt gtt ccc agg gct gat cag aca gct agg agg ggc aaa gtg cat
thr ser pro phe val pro arg ala asp gln thr ala arg arg gly lys val his

gtt cca ttc cct ttg act aac gtc acc tgc cga gtg ccg ttg gct cga gcg ccg gat gtc acc tat
val pro phe pro leu thr asn val thr cys arg val pro leu ala arg ala pro asp val thr tyr

ggt aag aag gag gtg acc ctg aga tta cac cca gat cat ccg acg ctc ttc tcc
gly lys lys glu val thr leu arg leu his pro asp his pro thr leu phe ser

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2

tat agg agt tta gga gcc gaa ccg cac ccg tac gag gag tgg gtt gac aag ttc tct gag cgc atc
tyr arg ser leu gly ala glu pro his pro tyr glu glu trp val asp lys phe ser glu arg ile

atc cca gtg acg gaa gaa ggg att gag tac cag tgg ggc aac aac ccg ccg gtc
ile pro val thr glu glu gly ile glu tyr gln trp gly asn asn pro pro val

cgc cta tgg gcg caa ctg acg acc gag ggc aaa ccc cat ggc tgg cca cat gaa atc att cag tac
arg leu trp ala gln leu thr thr glu gly lys pro his gly trp pro his glu ile ile gln tyr

tat tat gga cta tac ccc gcc gcc acc att gcc gca gta tcc ggg gcg agt ctg
tyr tyr gly leu tyr pro ala ala thr ile ala ala val ser gly ala ser leu

atg gcc ctc cta act cta gcg gcc aca tgc tgc atg ctg gcc acc gcg agg aga aag tgc cta aca
met ala leu leu thr leu ala ala thr cys cys met leu ala thr ala arg arg lys cys leu thr

cca tac gcc ttg acg cca gga gcg gtg gta ccg ttg aca ctg ggg ctg ctt tgc
pro tyr ala leu thr pro gly ala val val pro leu thr leu gly leu leu cys

tgc gca ccg agg gcg aac gca gca tca ttc gct gag act atg gca tat ctg tgg gac gag aac aaa
cys ala pro arg ala asn ala ala ser phe ala glu thr met ala tyr leu trp asp glu asn lys

acc ctc ttt tgg atg gaa ttc gcc gcc cca gcc gca gcg ctt gct ttg ctg gca
thr leu phe trp met glu phe ala ala pro ala ala ala leu ala leu leu ala

tgc tgt atc aaa agc ctg atc tgc tgt tgt aag cca ttt tct ttt tta gtg tta ctg agc ctg gga
cys cys ile lys ser leu ile cys cys cys lys pro phe ser phe leu val leu leu ser leu gly

gcc tcc gca aaa gct tac gag cac aca gcc aca att ccg aat gtg gtg ggg ttc
ala ser ala lys ala tyr glu his thr ala thr ile pro asn val val gly phe

ccg tat aag gct cac att gaa agg aat ggc ttc tcg ccc atg act ctg cag ctt gaa gtg gtg gag
pro tyr lys ala his ile glu arg asn gly phe ser pro met thr leu gln leu glu val val glu

aca agc ttg gaa ccc aca ctt aac ctg gag tac att acc tgc gaa tac aag acg
thr ser leu glu pro thr leu asn leu glu tyr ile thr cys glu tyr lys thr

gtg gtc cct tcg cca ttc atc aaa tgt tgc gga aca tca gaa tgc tca tcc aag gag cag cca gac
val val pro ser pro phe ile lys cys cys gly thr ser glu cys ser ser lys glu gln pro asp

tac caa tgc aag gtg tac acg ggt gta tac cca ttc atg tgg ggt gga gcc tac
tyr gln cys lys val tyr thr gly val tyr pro phe met trp gly gly ala tyr

tgt ttc tgc gac tcc gag aac acg cag ctc agc gag gcc tat gtc gac agg tca gac gtt tgc aaa
cys phe cys asp ser glu asn thr gln leu ser glu ala tyr val asp arg ser asp val cys lys

cat gat cac gca tcg gcc tac aag gca cac acg gcc tct cta aaa gca aca atc
his asp his ala ser ala tyr lys ala his thr ala ser leu lys ala thr ile

agg atc agt tat ggc acc atc aac cag acc acc gag gcc ttc gtt aat ggt gaa cac gcg gtc aac
arg ile ser tyr gly thr ile asn gln thr thr glu ala phe val asn gly glu his ala val asn

gtg ggc gga agc aag ttc atc ttt gga ccg atc tca aca gct tgg tca ccg ttc
val gly gly ser lys phe ile phe gly pro ile ser thr ala trp ser pro phe

gac aat aaa att gtc gtg tat aaa gat gat gtc tac aac cag gac ttc cca ccc tac gga tca ggc
asp asn lys ile val val tyr lys asp asp val tyr asn gln asp phe pro pro tyr gly ser gly

cag ccg ggt aga ttc gga gac att cag agc agg aca gtg gag agc aaa gac ttg
gln pro gly arg phe gly asp ile gln ser arg thr val glu ser lys asp leu

tat gcc aac acg gcc cta aaa ctc tca aga cca tca ccc ggg gtt gtg cat gtg cca tac acg cag
tyr ala asn thr ala leu lys leu ser arg pro ser pro gly val val his val pro tyr thr gln

aca cca tcc gga ttt aaa tat tgg ctg aag gag aaa gga tct tca ttg aat aca
thr pro ser gly phe lys tyr trp leu lys glu lys gly ser ser leu asn thr

aag gcc cct ttt ggc tgc aag ata aag acc aat cca gtc aga gcc atg gat tgt gca gtt ggc agt
lys ala pro phe gly cys lys ile lys thr asn pro val arg ala met asp cys ala val gly ser

3

ata cct gtg tcg atg gac ata cct gac agt gca ttc aca cga gtg gta gat gcc
ile pro val ser met asp ile pro asp ser ala phe thr arg val val asp ala

ccg gct gta aca gac ctg agc tgc cag gta gtg gtc tgt aca cac tcc tcc gat ttc gga gga gtt
pro ala val thr asp leu ser cys gln val val val cys thr his ser ser asp phe gly gly val

gcc aca ttg tct tac aaa acg gac aaa ccc ggc aag tgc gct gtc cac tca cat
ala thr leu ser tyr lys thr asp lys pro gly lys cys ala val his ser his

tcc aac gtc gca acg ttg caa gag gcg acg gtg gat gtc aag gag gat gcc aag gtc aca gtg cac
ser asn val ala thr leu gln glu ala thr val asp val lys glu asp gly lys val thr val his

ttt tcc acg gcg tcc gcc tcc ccg gcc ttc aaa gtg tcc gtc tgt gac gca aaa
phe ser thr ala ser ala ser pro ala phe lys val ser val cys asp ala lys

aca acg tgc acg gcg gcg tgc gag cct cca aaa gac cac atc gtc cct tat ggg gcg agc cat aac
thr thr cys thr ala ala cys glu pro pro lys asp his ile val pro tyr gly ala ser his asn

aac cag gtc ttt ccg gac atg tca gga act gcg atg acg tgg gtg cag agg ctg
asn gln val phe pro asp met ser gly thr ala met thr trp val gln arg leu

gcc agt ggg tta ggt ggg ctg gct ctc atc gcg gtg gtt gtg ctg gtc ttg gta acc tgc ata aca
ala ser gly leu gly gly leu ala leu ile ala val val val leu val leu val thr cys ile thr

atg cgt cgg taa
met arg arg

SEQ ID 2: Ebola virus Zaire, subtype Mayinga Strain Genome, Genbank Accession
Number U23187

caacaacaca

atg ggc gtt aca gga ata ttg cag tta cct cgt gat cga ttc aag agg aca tca ttc
met gly val thr gly ile leu gln leu pro arg asp arg phe lys arg thr ser phe

ttt ctt tgg gta att atc ctt ttc caa aga aca ttt tcc atc cca ctt gga gtc
phe leu trp val ile ile leu phe gln arg thr phe ser ile pro leu gly val

atc cac aat agc aca tta cag gtt agt gat gtc gac aaa cta gtt tgt cgt gac aaa ctg tca tcc
ile his asn ser thr leu gln val ser asp val asp lys leu val cys arg asp lys leu ser ser

aca aat caa ttg aga tca gtt gga ctg aat ctc gaa ggg aat gga gtg gca act
thr asn gln leu arg ser val gly leu asn leu glu gly asn gly val ala thr

gac gtg cca tct gca act aaa aga tgg ggc ttc agg tcc ggt gtc cca cca aag gtg gtc aat tat
asp val pro ser ala thr lys arg trp gly phe arg ser gly val pro pro lys val val asn tyr

gaa gct ggt gaa tgg gct gaa aac tgc tac aat ctt gaa atc aaa aaa cct gac
glu ala gly glu trp ala glu asn cys tyr asn leu glu ile lys lys pro asp

ggg agt gag tgt cta cca gca gcg cca gac ggg att ccg ggc ttc ccc ccg tgc ccg tat gtg cac
gly ser glu cys leu pro ala ala pro asp gly ile arg gly phe pro arg cys arg tyr val his

aaa gta tca gga acg gga ccg tgt gcc gga gac ttt gcc ttc cat aaa gag ggt
lys val ser gly thr gly pro cys ala gly asp phe ala phe his lys glu gly

gct ttc ttc ctg tat gat cga ctt gct tcc aca gtt atc tac cga gga acg act ttc gct gaa ggt
ala phe phe leu tyr asp arg leu ala ser thr val ile tyr arg gly thr thr phe ala glu gly

4

gtc gtt gca ttt ctg ata ctg ccc caa gct aag aag gac ttc ttc agc tca cac
 val val ala phe leu ile leu pro gln ala lys lys asp phe phe ser ser his

 ccc ttg aga gag ccg gtc aat gca acg gag gac ccg tct agt ggc tac tat tct acc aca att aga
 pro leu arg glu pro val asn ala thr glu asp pro ser ser gly tyr tyr ser thr thr ile arg

 tat cag gct acc ggt ttt gga acc aat gag aca gag tac ttg ttc gag gtt gac
 tyr gln ala thr gly phe gly thr asn glu thr glu tyr leu phe glu val asp

 aat ttg acc tac gtc caa ctt gaa tca aga ttc aca cca cag ttt ctg ctc cag ctg aat gag aca
 asn leu thr tyr val gln leu glu ser arg phe thr pro gln phe leu leu gln leu asn glu thr

 ata tat aca agt ggg aaa agg agc aat acc acg gga aaa cta att tgg aag gtc
 ile tyr thr ser gly lys arg ser asn thr thr gly lys leu ile trp lys val

 aac ccc gaa att gat aca aca atc ggg gag tgg gcc ttc tgg gaa act aaa aaa aAc ctc act aga
 asn pro glu ile asp thr thr ile gly glu trp ala phe trp glu thr lys lys asn leu thr arg

 aaa att cgc agt gaa gag ttg tct ttc aca gtt gta tca aac gga gcc aaa aac
 lys ile arg ser glu glu leu ser phe thr val val ser asn gly ala lys asn

 atc agt ggt cag agt ccg gcg cga act tct tcc gac cca ggg acc aac aca aca act gaa gac cac
 ile ser gly gln ser pro ala arg thr ser ser asp pro gly thr asn thr thr thr glu asp his

 aaa atc atg gct tca gaa aat tcc tct gca atg gtt caa gtg cac agt caa gga
 lys ile met ala ser glu asn ser ser ala met val gln val his ser gln gly

 agg gaa gct gca gtg tgc cat cta aca acc ctt gcc aca atc tcc acg agt ccc caa tcc ctc aca
 arg glu ala ala val ser his leu thr thr leu ala thr ile ser thr ser pro gln ser leu thr

 acc aaa cca ggt ccg gac aac agc acc cat aat aca ccc gtg tat aaa ctt gac
 thr lys pro gly pro asp asn ser thr his asn thr pro val tyr lys leu asp

 atc tct gag gca act caa gtt gaa caa cat cac cgc aga aca gac aac gac agc aca gcc tcc gac
 ile ser glu ala thr gln val glu gln his his arg arg thr asp asn asp ser thr ala ser asp

 act ccc tct gcc acg acc gca gcc gga ccc cca aaa gca gag aac acc aac acg
 thr pro ser ala thr thr ala ala gly pro pro lys ala glu asn thr asn thr

 agc aag agc act gac ttc ctg gac ccc gcc acc aca aca agt ccc caa aac cac agc gag acc gct
 ser lys ser thr asp phe leu asp pro ala thr thr thr ser pro gln asn his ser glu thr ala

 ggc aac aac aac act cat cac caa gat acc gga gaa gag agt gcc agc agc ggg
 gly asn asn asn thr his his gln asp thr gly glu glu ser ala ser ser gly

 aag cta ggc tta att acc aat act att gct gga gtc gca gga ctg atc aca ggc ggg aga aga act
 lys leu gly leu ile thr asn thr ile ala gly val ala gly leu ile thr gly gly arg arg thr

 cga aga gaa gca att gtc aat gct caa ccc aaa tgc aac cct aat tta cat tac
 arg arg glu ala ile val asn ala gln pro lys cys asn pro asn leu his tyr

 tgg act act cag gat gaa ggt gct gca atc gga ctg gcc tgg ata cca tat ttc ggg cca gca gcc
 trp thr thr gln asp glu gly ala ala ile gly leu ala trp ile pro tyr phe gly pro ala ala

 gag gga att tac ata gag ggg cta atg cac aat caa gat ggt tta atc tgt ggg
 glu gly ile tyr ile glu gly leu met his asn gln asp gly leu ile cys gly

 ttg aga cag ctg gcc aac gag acg act caa gct ctt caa ctg ttc ctg aga gcc aca act gag cta
 leu arg gln leu ala asn glu thr thr gln ala leu gln leu phe leu arg ala thr thr glu leu

 cgc acc ttt tca atc ctc aac cgt aag gca att gat ttc ttg ctg cag cga tgg
 arg thr phe ser ile leu asn arg lys ala ile asp phe leu leu gln arg trp

 ggc ggc aca tgc cac att ctg gga ccg gac tgc tgt atc gaa cca cat gat tgg acc aag aac ata
 gly gly thr cys his ile leu gly pro asp cys cys ile glu pro his asp trp thr lys asn ile

 aca gac aaa att gat cag att att cat gat ttt gtt gat aaa acc ctt ccg gac
 thr asp lys ile asp gln ile ile his asp phe val asp lys thr leu pro asp

5

cag ggg gac aat gac aat tgg tgg aca gga tgg aga caa tgg ata ccg gca ggt att gga gtt aca
gln gly asp asn asp asn trp trp thr gly trp arg gln trp ile pro ala gly ile gly val thr
ggc gtt ata att gca gtt atc gct tta ttc tgt ata tgc aaa ttt gtc ttt tag
gly val ile ile ala val ile ala leu phe cys ile cys lys phe val phe
ttttcttcagattgcttcattggaaaagctcagcctcaaataaatgaaaccaggatttaa
ttatatggattacttgaatctaagattacttgacaaatgataatataatacactggagct
ttaaacatagccaatgtgattctaactcctttaaactcacagttaatacataaacaaggtt
tga

SEQ ID 3: Marburg virus Genome, Genbank Accession Number Z12132

taccctaac
atg aag acc aca tgt ttc ctt atc agt ctt atc tta att caa ggg aca aaa aat ctc ccc att tta
Met lys thr thr cys phe leu ile ser leu ile leu ile gln gly thr lys asn leu pro ile leu
gag ata gct agt aat aat caa ccc caa aat gtg gat tcg gta tgc tcc gga act
glu ile ala ser asn asn gln pro gln asn val asp ser val cys ser gly thr
ctc cag aag aca gaa gac gtc cat ctg atg gga ttc aca ctg agt ggg caa aaa gtt gct gat tcc
leu gln lys thr glu asp val his leu met gly phe thr leu ser gly gln lys val ala asp ser
cct ttg gag gca tcc aag cga tgg gct ttc agg aca ggt gta cct ccc aag aat
pro leu glu ala ser lys arg trp ala phe arg thr gly val pro pro lys asn
gtt gag tac aca gag ggg gag gaa gcc aaa aca tgc tac aat ata agt gta acg gat ccc tct gga
val glu tyr thr glu gly glu glu ala lys thr cys tyr asn ile ser val thr asp pro ser gly
aaa tcc ttg ctg tta gat cct cct acc aac atc cgt gac tat cct aaa tgc aaa
lys ser leu leu leu asp pro pro thr asn ile arg asp tyr pro lys cys lys
act atc cat cat att caa ggt caa aac cct cat gca cag ggg atc gcc ctt cat tta tgg gga gca
thr ile his his ile gln gly gln asn pro his ala gln gly ile ala leu his leu trp gly ala
ttt ttt ctg tat gat cgc att gcc tcc aca aca atg tac cga ggc aaa gtc ttc
phe phe leu tyr asp arg ile ala ser thr thr met tyr arg gly lys val phe
gaa ggg aac ata gca gct atg att gtc aat aag aca gtg cac aaa atg att ttc tcg cgg caa gga
thr glu gly asn ile ala ala met ile val asn lys thr val his lys met ile phe ser arg gln
caa ggg tac cgt cat atg aat ctg act tct act aat aaa tat tgg aca agt
gly gln gly tyr arg his met asn leu thr ser thr asn lys tyr trp thr ser
agt aac gga acg caa acg aat gac act gga tgt ttc ggc gct ctt caa gaa tac aat tct aca aag
ser asn gly thr gln thr asn asp thr gly cys phe gly ala leu gln glu tyr asn ser thr lys
aac caa aca tgt gct ccg tcc aaa ata cct cca cca ctg ccc aca gcc cgt ccg
asn gln thr cys ala pro ser lys ile pro pro pro leu pro thr ala arg pro
gag atc aaa ctc aca agc acc cca act gat gcc acc aaa ctc aat acc acg gac cca agc agt gat
glu ile lys leu thr ser thr pro thr asp ala thr lys leu asn thr thr asp pro ser ser asp
gat gag gac ctc gca aca tcc ggc tca ggg tcc gga gaa cga gaa ccc cac aca
asp glu asp leu ala thr ser gly ser gly ser gly glu arg glu pro his thr
act tct gat gcg gtc acc aag caa ggg ctt tca tca aca atg cca ccc act ccc tca cca caa cca
thr ser asp ala val thr lys gln gly leu ser ser thr met pro pro thr pro ser pro gln pro
agc acg cca cag caa gga gga aac aac aca aac cat tcc caa gat gct gtg act
ser thr pro gln gln gly gly asn asn thr asn his ser gln asp ala val thr

6

gaa cta gac aaa aat aac aca act gca caa ccg tcc atg ccc cct cat aac act acc aca atc tct
glu leu asp lys asn asn thr thr ala gln pro ser met pro pro his asn thr thr thr ile ser

act aac aac acc tcc aaa cac aac ttc agc act ctc tct gca cca tta caa aac
thr asn asn thr ser lys his asn phe ser thr leu ser ala pro leu gln asn

acc acc aat gac aac aca cag agc aca atc act gaa aat gag caa acc agt gcc ccc tcg ata aca
thr thr asn asp asn thr gln ser thr ile thr glu asn glu gln thr ser ala pro ser ile thr

acc ctg cct cca acg gga aat ccc acc aca gca aag agc acc agc agc aaa aaa
thr leu pro pro thr gly asn pro thr thr ala lys ser thr ser ser lys lys

ggc ccc gcc aca acg gca cca aac acg aca aat gag cat ttc acc agt cct ccc ccc acc ccc agc
gly pro ala thr thr ala pro asn thr thr asn glu his phe thr ser pro pro pro thr pro ser

tcg act gca caa cat ctt gta tat ttc aga aga aag cga agt atc ctc tgg agg
ser thr ala gln his leu val tyr phe arg arg lys arg ser ile leu trp arg

gaa ggc gac atg ttc cct ttt ctg gat ggg tta ata aat gct cca att gat ttt gac cca gtt cca
glu gly asp met phe pro phe leu asp gly leu ile asn ala pro ile asp phe asp pro val pro

aat aca aaa aca atc ttt gat gaa tcc tct agt tct ggt gcc tcg gct gag gaa
asn thr lys thr ile phe asp glu ser ser ser ser gly ala ser ala glu glu

gat caa cat gcc tcc ccc aat att agt tta act tta tct tat ttt cct aat ata aat gag aac act
asp gln his ala ser pro asn ile ser leu thr leu ser tyr phe pro asn ile asn glu asn thr

gcc tac tct gga gaa aat gag aat gat tgt gat gca gag tta aga att tgg agc
ala tyr ser gly glu asn glu asn asp cys asp ala glu leu arg ile trp ser

gtt cag gag gat gac ctg gcc gca ggg ctc agt tgg ata ccg ttt ttt ggc cct gga att gaa gga
val gln glu asp asp leu ala ala gly leu ser trp ile pro phe phe gly pro gly ile glu gly

ctt tac act gct gtt tta att aaa aat caa aac aat ttg gtc tgc agg ttg agg
leu tyr thr ala val leu ile lys asn gln asn asn leu val cys arg leu arg

cgt cta gcc aat caa act gcc aaa tcc ttg gaa ctc tta ttg aga gtc aca act gag gaa aga aca
arg leu ala asn gln thr ala lys ser leu glu leu leu leu arg val thr thr glu glu arg thr

ttc tcc tta atc aat aga cat gct att gac ttt cta ctc aca aga tgg gga gga
phe ser leu ile asn arg his ala ile asp phe leu leu thr arg trp gly gly

aca tgc aaa gtg ctt gga cct gat tgt tgc atc ggg ata gaa gac ttg tcc aaa aat att tca gag
thr cys lys val leu gly pro asp cys cys ile gly ile glu asp leu ser lys asn ile ser glu

caa att gac caa att aaa aag gac gaa caa aaa gag ggg act ggt tgg ggt ctg
gln ile asp gln ile lys lys asp glu gln lys glu gly thr gly trp gly leu

ggt ggt aaa tgg tgg aca tcc gac tgg ggt gtt ctt act aac ttg ggc att ttg cta cta tta tcc
gly gly lys trp trp thr ser asp trp gly val leu thr asn leu gly ile leu leu leu leu ser

ata gct gtc ttg att gct cta tcc tgt att tgt cgt atc ttt act aaa tat atc
ile ala val leu ile ala leu ser cys ile cys arg ile phe thr lys tyr ile

gga taa
gly

cgtaa aatgtgtaat gattaggact ttaggacaat tgctactgag ccc